METHOD AND APPARATUS FOR RE-SIZING AN ACTIVE AREA OF A FLEXIBLE DISPLAY

FIELD

[0001] This invention relates generally to flexible displays, and more particularly to touch sensitive flexible displays.

BACKGROUND

[0002] Flexible displays of various constructs are becoming more viable for commercial applications. In some instances, wearable devices are including flexible displays, yet resizing of such displays are not discussed or contemplated. In other instances, non-flexible touch-screens allow for altering an active area for touch sensitivity as opposed to an active area for visual display of content on such screens. As flexible displays become more accommodating to other body worn applications, certain limitations may become more apparent. For example, where a flexible display is wrapped or flexed, as in the case of a large-screen, wrist-wearable device, the entire display may not be visible to the user and yet no easy means of limiting a display area is currently available.

SUMMARY

[0003] Embodiments in accordance with the present invention can provide a method and device that enables users to resize or adjust an active area on a flexible display. The flexible display can be a touch screen that can enable a user to set the active area for display.

[0004] In a first embodiment of the present invention, a reconfigurable device can include a reconfigurable housing and a flexible display, the shape of the display flexibly alterable to accommodate different shapes of the housing. The reconfigurable device can further include a processor that is operable to receive signals indicative of the shape of the flexible display and to control the active area of display dependent upon the shape of the housing. The processor can also re-size the active area of the flexible display dependent on the shape of the display or the housing. The device can also include a sensor generating a signal indicative of the curvature of the display. The processor can also be operable to control the active area of the display such that the active area of the display is proportional to the curvature of the display. The housing can be configurable to a plurality of predetermined orientations and the processor is operable to control the active area of the display to be a predetermined area associated with each configuration. The device can further include a memory for storing respective active areas associated with each configuration and at least one sensor for detecting the housing configuration.

[0005] The flexible display can have a flat configuration enabling the processor to control the entire display to be active in the flat configuration. The display can have at least one curved configuration and the processor controls the active area to be less than half of the full display area when the display is in the at least one curved configuration. The device can further include a display driver coupled to the processor where the processor controls the driver to alter the active area of the display. The flexible display can be a touch sensitive screen coupled to the processor where the processor is programmed to initiate a re-sizing program for re-sizing an active area of the flexible display and to re-size the active area of the display when activating at least two points on the flexible display to indicate dimensions of the active area for display. The processor can be further programmed to resize fonts corresponding to the dimensions of the active area or to resize graphic elements corresponding to the dimensions of the active area. The processor can initiate the resizing program by altering the flexible display away from a flat position. The flexible display can further include a switch that detects the mating of a first end of the flexible display with a second end of the flexible display which initiates the resizing program. The reconfigurable device can selectively be a wrist-worn device or a hand-held device.

[0006] In a second embodiment of the present invention, an electronic product having a flexible display can include a flexible touch sensitive screen and a controller (or processor) coupled to the flexible touch sensitive screen. The controller (or processor) can be programmed to initiate a re-sizing program for re-sizing an active area of the flexible display and re-size the active area of the display when activating at least two points on the flexible display to indicate dimensions of the active area. The controller can further be programmed to resize fonts or graphic elements or both corresponding to the dimensions of the active area. The controller can initiate the resizing program by altering the flexible display from a flat position to a non-flat position. The flexible display can further include a switch that detects the mating of a first end of the flexible display with a second end of the flexible display which initiates the resizing program. The flexible display can be a touch sensitive screen where the controller resizes the flexible display by sensing the activation of at least two points on the flexible display. The flexible display can selectively be a wrist-worn device or a hand-held device selected among a cellular phone, a personal digital assistant, a smart phone, an MP3 Player, a music player, a remote controller, a wrist-worn computer, and a watch.

[0007] In a third embodiment of the present invention, a method of re-sizing an active area of a flexible display within a reconfigurable housing can include the steps of initiating a re-sizing program upon detection of an altered shape for the flexible display or the reconfigurable housing, receiving signals indicative of the altered shape of the flexible display or reconfigurable housing, and controlling an active area of the flexible display dependent upon the shape of the housing or the display. The method can further include the step of activating at least two points on the flexible display to indicate dimensions of the active area for display. The step of activating at least two points can include the step of touch sensing the at least two points on the flexible display. The method can further include the step of re-sizing fonts corresponding to the dimensions of the active area and the step of re-sizing graphic elements corresponding to the dimensions of the active area. The step of initiating the resizing program can be done by recognizing that a first end has mated with a second end of the flexible display.

[0008] The terms "a" or "an," as used herein, are defined as one or more than one. The term "plurality," as used herein, is defined as two or more than two. The term "another," as used herein, is defined as at least a second or more. The terms "including" and/or "having," as used herein, are defined as comprising (i.e., open language). The term "coupled," as used herein, is defined as connected, although not necessarily directly, and not necessarily mechanically. A "flexible display" can be a flexible screen and flexible frame or a flexible screen alone and is not limited to any particular technology as long as it is flexible. Such technologies can include reflective "e-paper" and emissive organic light-emitting diode (OLED)